[redacted]

JS 3/2/22

P-19-0138

Chemical Name: [redacted]
CASRN: [redacted]

Human Health Report Status:	DATE COMPLETED
HAZARD DRAFT- Pending Review	08/12/2019
HAZARD REVIEWED	08/15/2019
HAZARD FINAL	08/15/2019
RISK DRAFT- pending review	08/23/2019
RISK REVIEWED	10/06/2019
RISK- FINAL- Uploaded	
UPDATE DRAFT	10/24/2019
UPDATE DRAFT REVIEWED	10/24/2019
UPDATE FINAL- Uploaded	10/25/2019
REVISED DRAFT	05/01/2020
REVISED FINAL - Uploaded	05/07/2020

[redacted]

1 HUMAN HEALTH SUMMARY

EPA estimated the human health hazard of this chemical substance based on its estimated physical/chemical properties and by comparing it to structurally analogous chemical substances for which there is information on human health hazard.

Based on the hazard determination and available quantitative and/or qualitative risk information, EPA concludes that there is risk for the new chemical substance.

1.1 Hazard Summary

EPA estimated the human health hazard of this chemical substance based on its estimated physical/chemical properties and by comparing it to structurally analogous chemical substances for which there is information on human health hazard. Absorption is expected to be good via all routes for the hydrolysis products based on analogues and physical/chemical properties. For the new chemical substance, EPA identified corrosion to all exposed tissues, acute toxicity, cardiotoxicity, systemic effects as hazards based release of [redacted] and skin irritation, serious eye damage, reproductive/developmental, immune, blood, kidney and liver effects based on analogue data for the [redacted] hydrolysis product. Surface tension data were submitted on the new chemical substance and the substance was not surface active. EPA identified an inhalation LOAEC of 0.41 mg/m^3 based on respiratory effects of [redacted] and a BMDL of 0.023 mg/kg/day based on liver and reproductive effects of the acid hydrolysis product which are protective for all health effects with the exception of irritation/corrosion and were used to derive exposure route- and population-specific points of departure for quantitative risk assessment. Irritation and corrosion hazards were evaluated qualitatively.

1.2 Exposure and Risk Summary

For this assessment, EPA assessed worker exposure via dermal and inhalation exposures. Releases to air were estimated. No releases to water or landfill are expected. Exposure to the general population was assessed via stack and fugitive air inhalation. Exposure to the general population via groundwater (landfill leachate) was not assessed because releases were expected to be negligible (below modeling thresholds). Consumer exposures were not assessed because consumer uses were not identified as conditions of use.

Risks to human health for the new chemical substances were evaluated using the route-specific effect levels (i.e., LOAEC and BMDL) described above.

1.2.1 Workers

Risks were identified for workers for respiratory effects via inhalation exposure based on quantitative hazard data for a hydrolysis product, [redacted] (MOE = 0.0001; Benchmark MOE = 30; inhalation fold factor = 278,198).

Risks were identified for workers for liver and developmental effects via dermal exposure based on quantitative hazard data for analogue of the [redacted] (MOE = 0.001; Benchmark MOE = 30).

[redacted]

Corrosion hazards to workers via dermal contact were identified based on reactivity and the hydrolysis product. Risks for these endpoints were not quantified due to a lack of dose-response for these hazards. However, exposures can be mitigated by the use of appropriate personal protective equipment (PPE), including impervious gloves and eye protection. EPA expects that employers will require and that workers will use appropriate PPE consistent with the Safety Data Sheet prepared by the new chemical submitter, in a manner adequate to protect them.

1.2.2 General Population

Risks were not identified for the general population for liver and developmental effects via stack air inhalation exposure based on quantitative hazard data for an analogue of [redacted] (MOE = 794; Benchmark MOE = 30).

Risks were not identified for the general population for respiratory effects via fugitive air inhalation exposure based on quantitative hazard data for a hydrolysis product, [redacted] (MOE = 1506; Benchmark MOE = 30).

Corrosion hazards to the general population are not expected via stack and fugitive air releases due to dilution of the chemical substance in the media.

Risks were not evaluated for the general population via drinking water, fish ingestion, and groundwater ingestion via landfill leachate routes because of no predicted environmental releases to water and all predicted environmental releases to landfill are below modeling assessment thresholds.

1.2.3 Consumers

Risks to consumer were not evaluated because consumer uses were not identified as conditions of use.

1.3 Assumptions and Uncertainties

Absorption of the new chemical substance is based on physical/chemical properties and analogues.
Hydrolysis is assumed to be important based on structure.
Health effects are based on structure, analogue data, and presumed hydrolysis products.

1.4 Potentially Useful Information

- Specific Target Organ Toxicity
- Pulmonary Effects
- Acute Toxicity
- Skin Irritation/Corrosion
- Serious Eye Damage
- Reproductive Toxicity

[redacted]

1.5 Hazard Language

Acute toxicity, Skin corrosion, Serious eye damage, Specific target organ toxicity, Reproductive toxicity

[redacted]

2 HUMAN HEALTH HAZARD

2.1 Chemistry Summary

[redacted]

The substance will hydrolyze (sec) to yield [redacted]

2.2 Hazard Summary

2.2.1 Absorption

Absorption is expected to be good via all routes with reaction of the [redacted] moiety based on analogues and physical/chemical properties.

2.2.2 Structural Alerts

Perfluoro compounds

[redacted]

2.2.3 Hazard Summary

There are concerns for cardiotoxicity, systemic effects (bone, kidney, liver) effects, corrosion to all exposed tissues, acute toxicity and respiratory effects based on the hydrolysis product [redacted] Deaths have been reported in humans at unknown concentrations.

There are concerns for skin irritation and serious eye damage, systemic effects (liver, hematological, renal, developmental/reproductive, immune) based on data for an analogue of the [redacted] product [redacted]

2.2.4 Exposure Routes of Interest

Route of Interest	
X	Inhalation
X	Dermal
X	Ingestion

2.3 Toxicity Data

2.3.1 New Chemical Substance Data

OECD 115 Surface tension: The surface tension of an aqueous solution of the test item (1 g/L solution) was determined to be 70.8 mN/m at 20°C. New chemical substance was determined not to be surface active.

2.3.2 Analogue/Metabolite Data

2.3.2.1 [redacted]

- OECD 471 Bacterial Reverse Mutation Test: Negative with and without activation
- OECD 473 in vitro Mammalian Chromosome Aberration Test: Positive for chromosome aberrations in CHO cells with activation;
- OECD 486 Unscheduled DNA Synthesis (UDS) Test with Mammalian Liver Cells in vivo: Negative
- OECD 476 in vitro Mammalian Cell Gene Mutation Tests using the Hprt and xprt genes: negative with and without activation
- OECD 425 Acute Oral Toxicity: Up-and-Down Procedure: Rat (F) oral LD50 550 mg/kg;
- OECD 403 Acute Inhalation Toxicity: LD50 >5.2 mg/l
- OECD 402 Acute Dermal Toxicity: LD50 > 5000mg/kg

[redacted]

- Corrosive to skin using the in vitro Corrositex assay;
- OECD 442 Skin Sensitization LLNA: Positive for skin sensitization in mice with EC3 = 37% for [redacted] negative for [redacted];
- ADME data suggest the substance is not metabolized in vivo.

Per EPA Office of Water Public Comment Draft Human Health Toxicity Values for [redacted] and Its Ammonium Salt [redacted]

Hazards identified include liver, hematological, renal, developmental/reproductive, immune and suggestive evidence of carcinogenic potential.

Table 7. Summary of Study NOAELS/LOAELS

Study	Overall Study Quality (See Appendix B)	Doses (mg/kg/day)	NOAEL or LOAEL (mg/kg/day)	Effects at the LOAEL
28-Day Oral (Gavage) Toxicity Study in Rats (OECD TG 407) [redacted] (2008)	High (≥ 1 and < 1.7)	Males: 0, 0.3, 3, and 30 Females: 0, 3, 30, and 300	NOAEL = 0.3 LOAEL = 3	Hematological effects (↓ RBC count, hemoglobin, and hematocrit in males) Immune effects (↓ globulin and ↑ A/G ratio in males)
28-Day Oral (Gavage) Toxicity Study in Mice (OECD TG 407) [redacted] (2008)	High (≥ 1 and < 1.7)	0, 0.1, 3, and 30	NOAEL = 0.1 LOAEL = 3	Liver effects (single-cell necrosis in males, ↑ relative liver weight in in males, and ↑ hepatocellular hypertrophy in males) Hematological effects (↓ hemoglobin and hematocrit in males) Immune effects (↓ globulin in females, and ↑ A/G ratio in both sexes)
28-Day Oral (Gavage) Immunotoxicity Study in Mice [redacted] (2017)	High (≥ 1 and < 1.7)	0, 1, 10, and 100 Note: HFPO dimer acid	NOAEL = 10 LOAEL = 100	Immune effects (TDAR suppression in females, and ↑ lymphocytes in males)
90-Day Oral (Gavage) Toxicity Study in Rats (OECD TG 408) [redacted] (2009)	High (≥ 1 and < 1.7)	Males: 0, 0.1, 10, and 100 Females: 0, 10, 100, and 1,000	NOAEL = 0.1 LOAEL = 10	Hematological effects (↓ RBC count, hemoglobin, and hematocrit in males)
90-Day Oral (Gavage) Toxicity Study in Mice (OECD TG 408) [redacted] (2010)	High (≥ 1 and < 1.7)	0, 0.1, 0.5, and 5	NOAEL = 0.5 LOAEL = 5	Liver effects (↑AST, ALT, and ALP in males; ↑ relative liver weight in males; and ↑ hepatocellular hypertrophy and single-cell necrosis in males)
Combined Chronic Toxicity/ Oncogenicity Study in Rats (OECD TG 453) [redacted] (2013)	High (≥ 1 and < 1.7)	Males: 0, 0.1, 1, and 50 Females: 0, 1, 50, and 500	NOAEL = 1 LOAEL = 50	Liver effects (centrilobular necrosis in both sexes; ↑ ALP, ALT, and SDH in males; and ↑ centrilobular hepatocellular hypertrophy and cystic focal degeneration in males)
Oral (Gavage) Reproduction/ Developmental Toxicity Study in Mice (OECD TG 421; modified according to the Consent Order) [redacted] (2010)	High (≥ 1 and < 1.7)	0, 0.1, 0.5, and 5	NOAEL (F_0) = 0.1 LOAEL (F_0) = 0.5 NOAEL (F_1) = 0.5 LOAEL (F_1) = 5	Liver effects (single-cell necrosis in males, and ↑ relative liver weight in both sexes) Developmental effects (↓ pup weights, and delays in the attainment of balanopreputial separation and vaginal patency)
Prenatal and Developmental Toxicity Study in Rats (OECD TG 414) [redacted] (2010)	High (≥ 1 and < 1.7)	0, 10, 100, and 1,000	NOAEL (F_0 and F_1) = 10 LOAEL (F_0 and F_1) = 100	Developmental effects (↑ early deliveries, ↓ fetal weights in both sexes, and ↓ gravid uterine weight)

[redacted]

POD_{HED} = 0.023 mg/kg/day, the HED based on the $BMDL_{10}$ for liver effects (single-cell necrosis) in parental male mice exposed to [redacted] by gavage for 84–85 days [redacted] 10 for UF_H, a 3 for UF_A

2.3.2.2 [redacted]

- OECD 442 Skin Sensitization LLNA: Negative for sensitization
- OECD 405 Acute Eye Irritation/ Corrosion: Corrosive to rabbit eyes.
- OECD 404 Acute Dermal Irritation/ Corrosion: Skin irritation in rabbits
- OECD TG 421 Reproduction/Developmental Toxicity Screening Test (Oral Gavage) Crl:CD1(ICR)Mice 20/sex/dose 0.1, 0.5, and 2.5 mg/kg-day. General toxicity in both generations primarily included abdominal distention, changes in body weight, large livers and increased liver weights, and some clinical signs. At the highest dose, three parental males died. EPA considers the value of 0.1 mg/kg-day to be the LOAEL for general toxicity based on increased liver weights seen at 0.1 mg/kg-day; EPA made this decision because the study authors did not evaluate clinical chemistry or histopathology at this dose. Effects seen at 0.1 mg/kg-day related to reduced numbers of implantations and corpora lutea, live litter size, surviving and live pups should be considered as related to treatment because similar effects are seen at higher doses. Although a dose-response is not always apparent, the data show that effects related to survival and litter size are consistent across doses; and thus the Agency considers 0.1 mg/kg-day a LOAEL for reproductive effects.
- OECD 408 90-day oral toxicity study: 10 Crl:CD(SD) rats/sex/dose by gavage, 0, 0.02, 0.1, and 0.5 mg/kg bw/day (males) and 0, 0.5, 5, and 50 mg/kg bw/day (females). The LOAEL is 0.1 mg/kg/day in males, based on liver cell hypertrophy/necrosis, kidney cell hypertrophy, hematology and clinical chemistry changes; the NOAEL for males is 0.02 mg/kg/day. In females, the LOAEL is 5 mg/kg bw/day based on liver and kidney effects and non-statistical increases in enzyme activity, with a NOAEL of 0.5 mg/kg bw/day.

2.3.2.3 [redacted]

- OECD 471 Ames assay (S. typhimurium and E. coli): negative with and without metabolic activation

[redacted]

2.3.2.4 [redacted]

Inhalation POD:

- ATSDR notes that cancer and reproductive/developmental studies are inconclusive/inadequate to draw a conclusion
- Acute duration inhalation MRL of 0.02 ppm (0.01637 mg/m$^{3)}$) fluoride was derived for hydrogen fluoride derived from a LOAEL of 0.5 ppm (0.41 mg/m^3) in humans with a UF of 3 for minimal LOAEL to NOAEL and 10 for intraspecies variability.
    - Protective for irritation/inflammation/necrosis of URT
    - Longer duration studies had higher PODs thus subchronic/chronic POD was not derived.
    - Study details: Very mild to moderate upper respiratory symptoms were reported by healthy men exposed to 0.5 ppm fluoride as hydrogen fluoride for 1 hour (Lund et al. 1997). At higher concentrations, 4.2–4.5 ppm fluoride as hydrogen fluoride for 1 hour, more severe symptoms of upper respiratory irritation were noted (Lund et al. 1997, 2002). In subjects exposed to 4.2 ppm for 1 hour, analysis of nasal lavage fluid provided suggestive evidence that hydrogen fluoride induces an inflammatory response in the nasal cavity (Lund et al. 2002). Similarly, bronchoalveolar lavage fluid analysis revealed suggestive evidence of bronchial inflammation in another study of subjects exposed to 1.9 ppm fluoride as hydrogen fluoride for 1 hour (Lund et al. 1999); no alterations were observed at 0.5 ppm.
- Acute inhalation of hydrogen fluoride fumes in combination with dermal exposure to hydrofluoric acid has been reported to cause death in humans. Actual exposure concentrations are not known in any of these cases. Death was generally due to pulmonary edema (resulting from irritation and constriction of the airways) or to cardiac arrhythmias with pronounced hyperkalemia, hypocalcemia, and hypomagnesemia. Lowest reported LC50 150 ppm is a GHS Category 2 Acute toxicity hazard.
- Hazards also include skeletal, liver, heart and renal effects

2.3.3 OECD QSAR Toolbox Data Summary

NCS Chemical Category (from Eco Report):

Table for Parent Compound

US EPA New Chemical Category	Neutral Organics
Respiratory sensitization alert	No alert found
Protein binding alerts for skin sensitization according to GHS	Skin sensitization Category 1A >> (Thio)Acyl and (thio)carbamoyl halides, cyanides, azides, etc.
Oncologic Primary Classification	Acyl and Benzoyl Type Compounds; Alpha- and beta-Haloether Reactive Functional Groups

Data for NCS Substance: None

Number of Metabolites Found: 7

[redacted]

2.3.4 SDS Data

The SDS appears relevant to the PMN substance based on matching product name/synonym [redacted]

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200

Acute toxicity (Inhalation) : Category 2

GHS label elements

Hazard pictograms :

Signal Word : Danger

Hazard Statements : H330 Fatal if inhaled.

Precautionary Statements :

Prevention:

P260 Do not breathe mist or vapors.
P271 Use only outdoors or in a well-ventilated area.
P284 Wear respiratory protection.

Response:

P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.

Storage:

P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Substance name : [redacted]

CAS-No. : [redacted]

Components

Chemical name	CAS-No.	Concentration (% w/w)
[redacted]		

- Parts of Section 11 of the SDS were excluded due to lack of relevant data/information

[redacted]

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation
Skin contact
Ingestion
Eye contact

Acute toxicity

Fatal if inhaled.

Product:

Acute inhalation toxicity	:	Acute toxicity estimate: 235 ppm Exposure time: 4 h Test atmosphere: gas Method: Calculation method

Components:

[redacted]

Acute inhalation toxicity	:	LC50 (Rat): 235 ppm Exposure time: 4 h Test atmosphere: gas Method: OECD Test Guideline 403

Carcinogenicity

Not classified based on available information.

IARC	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

2.3.5 Other Information

Hydrolysis of the [redacted]

[redacted]

2.4 Human Health Category (From US EPA 2010 document)

N/A for human health

2.5 Point of Departure (POD) Selected and Basis

2.5.1 POD for [redacted] of NCS), Inhalation Worker Exposures Only

POD type: LOAEC

POD Value: 0.41 mg [redacted]/m^3

POD Chemical: [redacted]

POD Route: Inhalation

[redacted]

POD Study Type: 1 hour inhalation exposure in humans

POD Hazard Endpoint: Respiratory effects

POD Basis: POD was the basis for the ATSDR assessment on HF. Protective for all effects related to inhalation exposure to [redacted] including acute toxicity since the study is a 1 hour exposure and is based on a minimal effect.

POD Benchmark MOE: 30 (10x for intraspecies, 3x for LOAEL to NOAEL based on minimal LOAEL effects per ATSDR)

Reference: ATSDR 2003 Toxicological Profile for Fluorides, [redacted], and Fluorine

2.5.2 POD for [redacted] for Oral/Dermal Exposures and Gen Pop Stack

POD type: BMDL

POD Value: 0.023 mg/kg/day

POD Chemical: [redacted]

POD Route: Oral

POD Study Type: OECD 421 Reproductive/developmental study

POD Hazard Endpoint: Liver and developmental effects

POD Basis: This POD was selected in the OW EPA draft on [redacted] an analogue of the new chemical substance. This POD is protective for all health concerns via oral/dermal exposures and is expected to be a more relevant POD for assessing general population concerns due the reactivity/volatility of the new chemical substance.

POD Benchmark MOE: 30 (10x for intraspecies variability, 3x for intraspecies)

Reference: EPA Office of Water Public Comment Draft Human Health Toxicity Values for [redacted]

[redacted]

3 HUMAN HEALTH RISK

3.1 USES and EXPOSURES

3.1.1 Uses

Intended Use: [redacted] intermediate, [redacted]

3.1.2 Worker Exposure

Per Engineering Report dated 03/31/2020

3.1.2.1 Inhalation

MFG and PROC: Purification of PMN

Sampling [redacted] *Product*

Exposure to Vapor (volatile) (Class II)

Worst Case PDR: [redacted] **mg/day** over [redacted] days/yr

Per submission, workers wear [redacted] helmet with supplied breathing air and [redacted] suit, which may mitigate worker exposures.

Equipment Cleaning

Exposure to Vapor (volatile) (Class II)

Worst Case PDR: [redacted] **mg/day** over [redacted] days/yr

Per submission, workers wear Nomex clothing, goggles, and butyl rubber gloves, which may mitigate worker exposures.

USE: [redacted] **Intermediate**

Inhalation exposures are expected to be negligible (below modeling thresholds). Per submission, workers wear [redacted] helmet with supplied breathing air and butyl acid suit during liquid sampling, which may mitigate worker exposures.

3.1.2.2 Dermal

MFG and PROC: Purification of the new chemical substance

Sampling [redacted] *Product*

Exposure to [redacted] at [redacted] concentration

High End PDR: [redacted] **mg/day** over [redacted] days/yr

Equipment Cleaning

Exposure to [redacted] at [redacted] concentration

High End PDR: [redacted] **mg/day** over [redacted] days/yr

USE: Chemical Intermediate

Dermal exposures are not expected. Per submission, workers wear [redacted] helmet with supplied breathing air and butyl acid suit during [redacted] sampling, which may mitigate worker exposures.

[redacted]

3.1.3 General Population Exposure

Per Exposure Report dated 4/3/2020

Exposure Scenario[1]	Water						Landfill	Stack Air		Fugitive Air	
Release activity(ies)[2]; exposure calculation(s)[3]	Drinking Water		Fish Ingestion		7Q10[4] CC = 153	PDM Days Exceeded	LADD	ADR (24-hr conc.)	LADD (Annual conc.)	ADR (24-hr conc.)	LADD (Annual conc.)
	ADR	LADD	ADR	LADD							
	mg/kg/day	mg/kg/day	mg/kg/day	mg/kg/day	µg/l	# Days	mg/kg/day	mg/kg/day (µg/m³)	mg/kg/day (µg/m³)	mg/kg/day (µg/m³)	mg/kg/day (µg/m³)
MFG/PROC/USE:Max ADR	--	--	--	--	--	--	--	2.07e-5 (1.10e-1)	-- (--)	4.32e-5 (2.40e-1)	-- (--)
MFG/PROC/USE:Max LADD	--	--	--	--	--	--	--	-- (--)	1.44e-8 (1.86e-4)	-- (--)	4.66e-8 (6.02e-4)

3.1.3.1 Drinking Water

Not released to surface water.

3.1.3.2 Fish

Not released to surface water.

3.1.3.3 Landfill

Exposures were not assessed.

3.1.3.4 Air/Inhalation

Stack: ADR as high as **2.07E-05 mg/kg/day (1.10E-1 µg/m³)** and LADD as high as **1.44E-8 mg/kg/day (1.86E-4 µg/m³)**.
Fugitive: ADR as high as **4.32E-05 mg/kg/day (2.40E-1 µg/m³)** and LADD as high as **4.66E-8 mg/kg/day (6.02E-4 µg/m³)**.

3.1.4 Consumer Exposure

No identified consumer exposures

3.2 RISK CALCULATIONS

3.2.1 Worker Calculations

Worker Margin of Exposure (MOE) Calculations using Animal Inhalation POD and Engineering Report PDR

	Animal or Human POD			Worker Exposure				Human Breathing Rates						Benchmark MOE	Endpoint Type
Exposure Route	POD Conc. mg/m³	POD Period hrs/day	POD Duration days/wk	Exposure mg/day Potential Dose Rate (PDR)	Total Worker Breathing Volume for PDR Exposure Period m³	Worker Exposure Duration Hours/Day	Exposure Duration Days/Wk	Default	Worker	Structural Alert as % of PMN	POD Conc - Duration & Breathing Rate Correction Scenario$_{HEC}$ mg/m³	Exposure TWA mg/m³	**Margin of Exposure MOE**	30	LOAEC
Inhalation	0.41	8.00	5	[redacted]	[redacted]	8.00	5	4.90	10.00	[redacted]	2.0E-01	6.9E+03	**0.0001**	Fold Factor =	278198

Risks were identified for workers for respiratory effects via inhalation exposure based on quantitative hazard data for a hydrolysis product, [redacted] fluoride (MOE = 0.0001; Benchmark MOE = 30; inhalation fold factor = 278,198).

[redacted]

Worker Margin of Exposure (MOE) Calculations using Animal Oral POD and Engineering Report PDR												
	Animal or Human			Human							Benchmark MOE	Endpoint Type
Exposure Route	POD mg/kg-day	POD Exposure Frequency Days/Wk	POD Route % Absorp	Exposure mg/day Potential Dose Rate (PDR)	Exposure Frequency Days/Wk	Exposure Route % Absorp	Body Weight kg	Exposure mg/kg-day	Structural Alert as % of PMN	Margin of Exposure MOE	30	BMDL
Dermal	2.3E-02	7	100%	2.2E+03	5	100%	80	2.8E+01	100%	**0.001**		

Risks were identified for workers for liver and developmental effects via dermal exposure based on quantitative hazard data for analogue (MOE = 0.001; Benchmark MOE = 30).

3.2.2 General Population Calculations

Population/Consumer Margin of Exposure (MOE) Calculations using Animal Oral POD and Exposure Report ADR												
	Animal or Human			Human							Benchmark MOE	Endpoint Type
Exposure Route	POD mg/kg-day	POD Exposure Frequency Days/Wk	POD Route % Absorp	Exposure mg/kg-day Acute Dose Rate (ADR)	Exposure Frequency Days/Wk	Exposure Route % Absorp	Multiplier for Susceptible Subpopulations	Structural Alert as % of PMN	Margin of Exposure MOE		30	BMDL
Stack Air Inhalation	0 02	5	100%	2.1E-05	7	100%	1 0	100%	**794**			

Risks were not identified for the general population for liver and developmental effects via stack air inhalation exposure based on quantitative hazard data for an analogue (MOE = 794; Benchmark MOE = 30).

Population/Consumer Margin of Exposure (MOE) Calculations using Animal Inhalation POD and Exposure Report 24-hr. conc.										Benchmark MOE	Endpoint Type
	Animal or Human POD			Population Exposure							
Inhalation Exposure Scenario	POD Conc. mg/m^3	POD Period hrs/day	POD Duration days/wk	Exposure (24-hr conc.) (ug/m3)	Population Exposure Duration Hours/Day	Exposure Duration Days/Wk	Structural Alert as % of PMN	POD Conc - Duration Correction - $Scenario_{HEC}$ mg/m^3	**Margin of Exposure MOE**	30	LOAEC
Fugitive air	0.41	8.00	5	2.4E-01	24.00	7	27%	9.8E-02	**1506**		

Risks were not identified for the general population for respiratory effects via fugitive air inhalation exposure based on quantitative hazard data for a hydrolysis product, [redacted] (MOE = 1506; Benchmark MOE = 30).

Risks were not evaluated for the general population via drinking water, fish ingestion, and groundwater ingestion via landfill leachate because of no predicted environmental releases to water and all predicted environmental releases to landfill are below modeling assessment thresholds.

[redacted]

3.2.3 Consumer Calculations

Risks to consumer were not evaluated because consumer uses were not identified as conditions of use.